

<b>Name of the course: Image and Signal Processing</b>	Total credits: 2+2+1=5
Lecture: IPM-18AUTISPE Practice: IPM-18AUTISPG	
Type: Obligatory	
Total hours per semester: <b>lecture: 26</b> <b>practice: 26</b> <b>consultation: 13</b>	
Type of testing: exam and practical grade Other: project, tests	
Semester: 1 <sup>st</sup>	
<b>Description</b>	
Signals and systems. Fourier-, Laplace-transform. AD conversion: sampling, quantization. DA conversion, Shannon's formulae. Windowing. Analog and discrete filters, Signal processing in time domain, in frequency domain. Basic concepts and methods of image processing. Edge detection, segmentation. Image reconstruction. Noise reduction.	
<b>Literature</b>	
<b>Compulsory</b>	
<ul style="list-style-type: none"> <li>• Steven W. Smith, The Scientist &amp; Engineer's Guide to Digital Signal Processing 1st Edition, California Technical Publishing, San Diego, ISBN-13: 978-0966017632, ISBN-10: 0966017633</li> </ul>	
<b>Recommended</b>	
<ul style="list-style-type: none"> <li>• Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing (3rd Edition), Pearson, ISBN-13: 978-0131687288, ISBN-10: 013168728X</li> </ul>	
<b>Competencies</b>	
<b>Knowledge</b>	
<ul style="list-style-type: none"> <li>• Possession of complex and up-to-date knowledge in the following areas of signal and image processing in the following areas: transform of analog and digital signals, steps and methods of signal processing, image transformation, enhancement, filtering, reconstruction.</li> <li>• Practice in Matlab based numerical solution of signal and image processing problems.</li> <li>• Detailed and expert-level knowledge of the technical terms and expressions of computer science in English.</li> </ul>	
<b>Competencies</b>	
<ul style="list-style-type: none"> <li>• Ability of construction proper models for various problems in signal and image processing.</li> <li>• Expertise in designing the method of solutions.</li> <li>• Expertise in design, development, operation and management tasks in the domain of signal and image processing.</li> <li>• Skills for cooperation and team work, and ability to take leading role.</li> <li>• Ability for written and oral communication in English, using the technical terms and expressions of computer science. Ability to argue, to prepare reports, to read, understand and exploit scientific and technical material (e.g. books and papers).</li> <li>• Expertise in utilizing sources of technical information, their critical interpretation and evaluation, and the extraction of information relevant to the solution of a specific problem.</li> <li>• Ability to perform supervised scientific research, and skills required for post-graduate</li> </ul>	

studies.

**Attitude**

- Attends professional, technological development related to their qualification.
- Commitment to critical feedback and self-assessment.
- Commitment to lifelong learning and receptivity to new IT competencies.
- Adopts and coordinates the ethical principles of work, organizational culture and research.
- Shares professional knowledge, mediates professional results.
- Mediates and implements eco-conscious behavior and social responsibility, helping them with IT tools.
- Commitment to quality standards and its IT tools.
- Open to initiate collaboration with IT and other specialists.

**Autonomy and responsibility**

- Takes responsibility for his professional decisions taken during his professional activities.
- Takes responsibility for observing and enforcing deadlines.
- Takes responsibility for own and fellow workers' work.
- In the case of operational critical IT systems, he/she can be assigned responsibility for development and operation, according to his/her professional competencies.